

**Return to
Manual**

Table 6-3
NFPA 473 Competencies for EMS Personnel Responding to Hazardous Materials Incidents
- Minimum Requirements Applicable to Fairfax County OHSP -

Competencies for EMS/HM Level Responders

Introduction

All EMS personnel at EMS/HM Level I, in addition to their BLS or ALS certification, shall be trained to meet at least the first responder awareness level as defined in NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents*, and all competencies of Chapter 2 of this standard. The goal of the competencies at EMS/HM Level I shall be to provide the individual with the knowledge and skills necessary to safely deliver emergency medical care in the cold zone. Therefore, the EMS/HM Level I responder shall be able to:

- Analyze a hazardous materials emergency to determine what risks are present to the provider and the patient by completing the following tasks: (1) determine hazards present to the Level I responder and the patient in a hazardous materials incident; (2) assess patient to determine the risk of secondary contamination.
- Plan a response to provide the appropriate level of emergency medical care to persons involved in hazardous materials incidents by completing the following tasks: (1) describe the role of the Level I responder in a hazardous materials incident; (2) plan a response to provide the appropriate level of emergency medical care in a hazardous materials incident; (3) determine if the personal protective equipment provided is appropriate; (4) determine if the equipment and supplies provided are adequate.
- Implement the planned response by completing the following tasks: (1) perform the necessary preparations for receiving the hazardous materials patient and preventing secondary contamination; (2) treat the hazardous materials patient; (3) transport the patient as appropriate.
- Terminate the incident.

**Return to
Manual**

Table 6-3
NFPA 473 Competencies for EMS Personnel Responding to Hazardous Materials Incidents
- Minimum Requirements Applicable to Fairfax County OHSP -

Competencies - Analyzing the Hazardous Materials Incident

Given an emergency involving hazardous materials, the Level I responder shall determine the hazards to the responder and the patient in that situation. The Level I responder shall be able to:

- Assess the nature and severity of the incident(s) (size-up) as they pertain to EMS responsibilities at a hazardous materials incident with evaluation of available resources and a request for any needed assistance.
- Evaluate the environmental factors as they affect patient care.
- Identify the information resources available and how to access the following: (1) poison control center; (2) medical control; (3) MSDS; (4) reference guidebooks; (5) hazardous materials data bases; (6) technical information centers (CHEMTREC, NRC, etc.); (7) technical specialists; (8) Agency for Toxic Substances and Disease Registry (ATSDR).

Given a pesticide label, identify and explain the significance of the following: (1) name of pesticide; (2) signal word; (3) EPA registration number; (4) precautionary statement; (5) hazard statement; (6) active ingredient.

Given a hazardous materials incident with a patient(s), the Level I responder shall determine the risk of secondary contamination. The Level I responder shall be able to:

- Explain basic toxicological principles relative to assessment and treatment of victims exposed to hazardous materials, including the following: (1) acute and delayed toxicity; (2) routes of exposure to toxic materials; (3) local and systemic effects; (4) dose response as it relates to risk assessment; (5) synergistic effects; (6) health hazards as determined by assessing toxicity, exposure, and dose.
- Describe how the chemical contamination of patients alters the principles of triage in hazardous materials incidents.
- Explain the need for patient decontamination procedures at hazardous materials incidents.
- Describe how the potential for secondary contamination determines the extent of patient decontamination required.
- Describe the way personnel, personal protective clothing, apparatus, tools, and equipment become contaminated and the importance and limitations of decontamination procedures.
- Explain the decontamination procedures as defined by the authority having jurisdiction for patients, personnel protective clothing, apparatus, tools, and equipment become contaminated and the importance and limitations of decontamination procedures.

**Return to
Manual**

Table 6-3
NFPA 473 Competencies for EMS Personnel Responding to Hazardous Materials Incidents
- Minimum Requirements Applicable to Fairfax County OHSP -

Competencies - Analyzing the Hazardous Materials Incident (Continued)

- Explain the decontamination procedures as defined by the authority having jurisdiction for patients, personnel, personal protective equipment, and apparatus at hazardous materials incidents.

Competencies - Planning the Response

Given a plan of action by the incident commander, the Level I responder shall describe their role in a hazardous materials incident as identified in the local emergency response plan or organization's standard operating procedures, including the following:

- Describe the emergency medical component for the hazardous materials incident response plan as developed by the authority having jurisdiction.
- State the Level I responder's role within the hazardous materials response plan as developed by the authority having jurisdiction.
- State the Level I responder's role within the hazardous materials incident management system.

Given a hazardous materials incident, the Level I responder shall be able to plan a response to provide the appropriate level of emergency medical care, including the standard operating procedures for the medical management of persons exposed to hazardous materials, as specified by the authority having jurisdiction.

Given the name of the hazardous material and the type, duration, and extent of exposure and decontamination process, the Level I responder shall determine if available personal protective clothing and equipment are appropriate to implement the planned response. The Level I responder shall be able to:

- Describe the application, use, and limitations of the following: (1) street clothing and work uniforms; (2) structural fire fighting protective clothing; (3) respiratory protective equipment; (4) chemical-protective clothing.

**Return to
Manual**

Table 6-3
NFPA 473 Competencies for EMS Personnel Responding to Hazardous Materials Incidents
- Minimum Requirements Applicable to Fairfax County OHSP -

Competencies - Planning the Response (Continued)

Given a simulated hazardous materials incident, the Level I responder shall determine if available equipment and supplies are appropriate to implement the planned response. The Level I responder shall be able to describe the equipment and supplies available to the Level I responder for the care and transportation of the hazardous materials incident patient.

Competencies - Implementing the Planned Response

Given a plan for providing patient care at a hazardous materials incident, the Level I responder shall be able to perform the preparations necessary to receive the patient for treatment and transport. The Level I responder shall be able to:

- List the information that needs to be communicated to the Medical Control/Receiving facility regarding the hazardous materials incident, including the following: (1) type and nature of the incident; (2) chemical involved and its physical state; (3) number of potential patients.
- Describe the procedure for preparing the vehicle and equipment for the patient.
- Demonstrate proper donning, doffing, usage, and limitations of all personal protective equipment provided to the Level I responder by the authority having jurisdiction for use in their hazardous materials response activities.
- Describe the concept of patient transfer from the incident site to the decontamination area and then to the treatment area.

Given a patient from a hazardous materials incident, the Level I responder shall provide patient care consistent with the planned response and the organization's standard operating procedures. The Level I responder shall be able to:

- Describe how chemical contamination alters the assessment and care of the hazardous materials patient.
- List the common signs and symptoms and describe the EMS treatment protocols for the following: (1) corrosives (e.g., acid, alkali); (2) pulmonary irritants (e.g. ammonia, chlorine); (3) pesticides (e.g. organophosphates, carbamates); (4) chemical asphyxiants (e.g. cyanide, carbon monoxide); (5) hydrocarbon solvents (e.g. xylene, methylene chloride).
- Explain the potential risk with invasive procedures for hazardous materials patients.

**Return to
Manual**

Table 6-3
NFPA 473 Competencies for EMS Personnel Responding to Hazardous Materials Incidents
- Minimum Requirements Applicable to Fairfax County OHSP -

Competencies - Implementing the Planned Response (Continued)

- Demonstrate the ability to perform the following EMS functions within the incident management system during incidents involving multiple hazardous materials patients: (1) EMS control; (2) triage; (3) treatment; (4) disposition and transportation.

Given a patient from a hazardous materials incident, the Level I responder shall transport the patient as specified in the local emergency response plan and the organization's standard operating procedures. The Level I responder shall be able to:

- Identify capabilities of the medical facilities available in the local area to receive hazardous materials patients.
- Identify acceptable vehicles available to transport hazardous materials patients from the treatment area to a receiving facility.
- List the pertinent information to be communicated to the receiving facility, including the following: (1) estimated time of arrival; (2) age/sex; (3) patient condition/chief complaint; (4) associated injuries; (5) routes, extent, and duration of chemical exposure; (6) pertinent medical history; (7) signs and symptoms; (8) vital signs; (9) treatment, including decontamination and patient response; (10) pertinent chemical characteristics.
- Describe actions necessary for the coordinated delivery of hazardous materials incidents patients to a receiving facility.
- Explain special hazards associated with air transportation of patients exposed to hazardous materials.

**Return to
Manual****Table 6-3
NFPA 473 Competencies for EMS Personnel Responding to Hazardous Materials Incidents
- Minimum Requirements Applicable to Fairfax County OHSP -****Competencies - Terminating the Incident**

Upon termination of the hazardous materials incident, the Level I responder shall complete the reporting, documentation, and EMS termination activities as required by the local emergency response plan or the organization's standard operating procedures. The Level I responder shall be able to:

- List the information to be gathered regarding the exposure of the patient and the EMS provider and describe the proper reporting procedures, including the following: (1) product information; (2) routes, extent, and duration of exposure; (3) Actions taken to limit exposure and contamination; (4) treatment rendered; (5) patient condition and disposition.
- Identify situations that can necessitate critical incident stress debriefing intervention.
- Describe the EMS provider's role in the post-incident critique.

Competencies for EMS/HM Level II Responders**Introduction**

All personnel at EMS/HM Level II shall be certified to the EMT-A level or higher and shall meet all competencies for EMS/HM Level I in addition to all the competencies of Chapter 3 of this standard. The goal of competencies at EMS/HM Level II responder shall be to provide the knowledge and skills necessary to perform and/or coordinate patient care activities and medical support of hazardous materials response personnel in the warm zone. Therefore, the Level II responder shall be able to:

- Analyze a hazardous materials incident to determine the magnitude of the problem in terms of outcomes by completing the following tasks: (1) Determine the hazards present to the Level II responder and the patient in a hazardous materials incident; (2) assess the patient to determine the patient care needs and the risk of secondary contamination.
- Plan a response to provide the appropriate level of emergency medical care to persons involved in hazardous materials incidents and to provide medical support to hazardous materials response personnel by completing the

**Return to
Manual**

Table 6-3
NFPA 473 Competencies for EMS Personnel Responding to Hazardous Materials Incidents
- Minimum Requirements Applicable to Fairfax County OHSP -

Competencies for EMS/HM Level II Responders

Introduction (Continued)

following tasks: (1) describe the role of the Level II responder in a hazardous materials incident; (2) plan a response to provide the appropriate level of emergency medical care in a hazardous materials incident' (3) determine if the personal protective equipment provided to EMS personnel is appropriate.

- Implement the planned response by completing the following tasks: (1) perform the necessary preparations for receiving the patient; (2) perform necessary treatment to the hazardous materials patient; (3) coordinate and manage the EMS component of the hazardous materials incident; (4) perform medical support of hazardous materials incident; terminate the incident.

Competencies - Analyzing the Hazardous Materials Incident

Given an emergency involving hazardous materials, the Level II responder shall determine the hazards to the responders and the patient in that situation. The Level II Responder shall be able to:

- Define the following chemical and physical properties and describe their importance in the risk assessment process: (1) boiling point; (2) flammable (explosive) limits; (3) flash point; (4) ignition temperature; (5) specific gravity; (6) vapor density; (7) vapor pressure; (8) water solubility.
- Define the following terms: (1) alpha radiation; (2) beta radiation; (3) gamma radiation.
- Define the following toxicological terms and explain their use in the risk assessment process: (1) threshold limit value (TLV-TWA); (2) lethal concentration and doses ($LD_{50/100}$); (3) parts per million/billion (ppm/ppb); (4) immediately dangerous to life and health (IDLH); (5) permissible exposure limit (PEL); (6) short-term exposure limit (TLV-STEL); (7) ceiling level (TLV-C).
- Given a specific hazardous material and using the information sources available to the Level II responder, demonstrate extracting appropriate information about the physical characteristics and chemical properties, hazards, and suggested medical response considerations for that material.

**Return to
Manual**

Table 6-3
NFPA 473 Competencies for EMS Personnel Responding to Hazardous Materials Incidents
- Minimum Requirements Applicable to Fairfax County OHSP -

Competencies - Analyzing the Hazardous Materials Incident

Given a hazardous materials incident with a patient(s), the Level II responder shall assess the patient and conditions to determine the risk of secondary contamination. The Level II responder shall be able to:

- Identify sources of technical information for the performance of patient decontamination.
- Identify factors that influence the decision of when and where to treat the patient and the extent of patient care, including the following: (1) hazardous material toxicity; (2) patient condition; (3) availability of decontamination.

Competencies - Planning the Response

Given a plan of action by the incident commander, the Level II responder shall describe his/her role in a hazardous materials incident as identified in the local emergency response plan or the organization's standard operating procedures. The Level II responder shall be able to describe the importance of coordination between various agencies at the scene of hazardous materials incidents.

Given a hazardous materials incident, the Level II responder shall plan a response to provide the appropriate level of emergency medical care to persons involved in hazardous materials incidents and to provide medical support to hazardous materials response personnel. The Level II responder shall be able to:

- Given a simulated hazardous materials incident, assess the problem and formulate and implement a plan including the following: (1) EMS control activities; (2) EMS component of an incident management system; (3) medical monitoring of personnel utilizing chemical-protective and high temperature-protective clothing; (4) triage of hazardous materials victims; (5) medical treatment for chemically contaminated individuals; (6) product and exposure information gathering documentation.
- Describe the importance of pre-emergency planning relating to specific sites.
- Describe the hazards and precautions to be observed when approaching a hazardous materials incident.
- Describe the considerations associated with the placement, location, and setup of the patient decontamination site techniques of decontamination and how they are or are not applicable to patient decontamination: (1) absorption; (2) chemical degradation; (3) dilution; (4) isolation.

**Return to
Manual**

Table 6-3
NFPA 473 Competencies for EMS Personnel Responding to Hazardous Materials Incidents
- Minimum Requirements Applicable to Fairfax County OHSP -

Competencies - Planning the Response (Continued)

- Describe when it would be prudent to pull back from a hazardous materials incident.

Given the name of the hazardous material and the type, duration, and extent of exposure, the Level II responder shall determine if the protective clothing and equipment available to EMS personnel is appropriate to implement the planned response. The Level II responder shall be able to: (1) identify the advantages and dangers of search and rescue missions at hazardous materials incidents; (2) identify the advantages and hazards associated with the rescue, extrication, and removal of a victim from a hazardous materials incident; (3) describe the types, application, use, and limitations of protective clothing used by EMS personnel at hazardous materials incidents; (4) demonstrate how to interpret a chemical compatibility chart for chemical-protective clothing.

Competencies - Implementing the Planned Response

Given a plan for providing patient care at a hazardous materials incident, the Level II responder shall perform the preparations necessary to receive the patient for treatment and transport. The Level II responder shall be able to demonstrate the proper donning, doffing, and usage of all personal protective equipment provided to the Level II responder by the authority having jurisdiction.

At the scene of a hazardous materials incident, the Level II responder shall be able to provide or coordinate the patient care. The Level II responder shall be able to:

- Given a simulated hazardous materials incident and using local available resources, demonstrate the implementation of the patient decontamination procedure.
- Explain the principles of emergency decontamination and its application for critically ill patients.
- Demonstrate ability to coordinate patient care activities, including treatment, disposition, and transportation of patients.

Given a simulated hazardous materials incident, the Level II responder shall be able to demonstrate the ability to establish and manage the EMS component of an incident management system.

**Return to
Manual**

Table 6-3
NFPA 473 Competencies for EMS Personnel Responding to Hazardous Materials Incidents
- Minimum Requirements Applicable to Fairfax County OHSP -

Competencies - Implementing the Planned Response (Continued)

Given a simulated hazardous materials incident, the Level II responder shall perform medical support of hazardous materials incident response personnel. The Level II responder shall be able to:

- Explain the components of pre-entry and post-entry assessment, including the following: (1) vital signs; (2) body weight; (3) general health; (4) neurological status; (5) electrocardiographic rhythm strip, if available.
- Explain the following factors and how they influence heat stress for hazardous materials response personnel: (1) hydration; (2) physical fitness; (3) environmental factors; (4) activity levels; (5) level of PPE; (6) duration of entry.
- Explain the medical monitoring protocols and demonstrate medical monitoring procedures for personnel at the scene of a hazardous materials incident.
- Describe the criteria for site selection of a medical monitoring station.
- Demonstrate the ability to set up and operate a medical monitoring station.
- Demonstrate the ability to interpret and analyze data obtained from medical monitoring of hazardous materials response personnel.
- Given a simulated hazardous materials incident, demonstrate proper documentation of medical monitoring.

Competencies - Terminating the Incident

Upon termination of the hazardous materials incident, the Level II responder shall complete the reporting, documentation, and EMS termination activities as required by the local emergency response plan or the organization's standard operating procedures. The Level II responder shall be able to:

- Describe information regarding incident EMS activities to be relayed through the chain of command to the incident commander.
- Describe activities required in terminating the EMS component of a hazardous materials incident.
- Describe process and demonstrate the ability to conduct the EMS portion of an incident critique.
- Explain process of making revisions to EMS operating procedures and response capabilities as a result of information learned.